

# **EXHIBIT 1**

March 31, 2022

**MEA File Number: 516090**

Prof. Paul Cassell  
S. J. Quinney College of Law at the University of Utah  
383 S. University St.  
Salt Lake City, UT. 84112-0730

**Attention: Prof. Paul Cassell**

**Re: Boeing 737 MAX Deferred Prosecution Agreement - Lion Air Flight 610  
and Ethiopian Airlines Flight 302  
Accident Dates: October 29, 2018 and March 10, 2019**

Attached please find the expert witness report for the above-captioned matter: Summary of Expert Testimony the Victims' Families Intend to Use Under Rules 702, 703 and 705 of the Federal Rules of Evidence. The conclusions and opinions begin on page 6. The analysis behind these conclusions and opinions are described in earlier sections of the report.

If you have any questions or additional requirements, please call. Thank you for asking us to assist you in this matter.

Yours very truly,  
**MEA Forensic Engineers & Scientists, Inc.**

A handwritten signature in black ink, appearing to read 'Vickie R. Norton'.

Vickie R. Norton, BSME, MSc, ATP  
Project Engineer

Enclosure: Expert Witness Report

## Expert Witness Rule 26 Report

**Re: Boeing 737 MAX Deferred Prosecution Agreement -  
Lion Air Flight 610 and Ethiopian Airlines Flight 302**

**Accident Dates: October 29, 2018 and March 10, 2019**

**Summary of Expert Testimony the Victims' Families Intend to Use  
Under Rules 720, 703 and 705 of the Federal Rules of Evidence**

**Prepared for:**

Professor Paul Cassell  
S. J. Quinney College of Law at the University of Utah  
383 S. University St.  
Salt Lake City, UT. 84112-0730

**Principal Author:**



Vickie R. Norton, BSME, MSc, ATP  
Project Engineer

Report Date: March 31, 2022

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## **1.0 QUALIFICATIONS**

I, Vickie R. Norton, BSME, MSc, ATP, am responsible for the contents of this report. I am a project engineer with MEA Forensic, leading the Aviation Division for our Los Angeles office since January 2009. I am a former Designated Engineering Representative (DER) to the Federal Aviation Administration (FAA). I am also a current, full-time airline captain for a major U.S. airline for the last 28 years with over 15,000 hours of flight time and over 7,500 hours as Pilot-in-Command (PIC) in Federal Aviation Regulations (FAR) Part 121 commercial scheduled service. I have been involved in the investigation of a wide variety of aircraft accidents and incidents for MEA since 2009, relying on my advanced degrees in Mechanical Engineering (BS) and Aviation/Aviation Safety (MSc), as well as my 34 years of experience in the aviation sector. My curriculum vitae is attached in Appendix A.

## **2.0 INSTRUCTIONS**

I have been asked to provide my opinions regarding the actions and omissions of the Boeing Company, (hereafter "Boeing") with specific regard to the Maneuvering Characteristics Augmentation System (MCAS) on the 737 MAX aircraft in relation to the crashes of Lion Air Flight 610 and Ethiopian Airlines Flight 302.

I am aware that my duty as an expert witness is to assist the court and not to act as an advocate for any party. This report has been prepared in accordance with that duty. If subsequently called upon to give oral or additional written testimony, I will provide said testimony in accordance with that duty.

## **3.0 BACKGROUND**

On October 29, 2018, Lion Air Flight 610 crashed into the Java Sea 13 minutes after takeoff from Jakarta, Indonesia, killing all 189 passengers and crew. On March 10, 2019, less than four and a half months later, Ethiopian Airlines Flight 302 crashed near the town of Bishoftu, Ethiopia six minutes after takeoff, killing all 157 passengers and crew. Both aircraft were new Boeing 737 MAX aircraft. The accidents prompted a worldwide, long-term grounding of the 737 MAX aircraft type amid an investigation into MCAS and the details surrounding flight testing and certification of the system and the aircraft.

## **4.0 ANALYSIS**

The focus of my analysis was to determine whether Boeing's crime of conspiracy charged in the criminal information filed against it was in any way causal and/or contributory to either or both the Lion Air and Ethiopian Airlines accidents. In so doing, I arrived at three main opinions, substantiated by supporting evidence, as outlined in sections 4.1 – 4.3.

For this analysis, I relied on my industry experience as delineated in Section 1.0 and outlined in my CV in Appendix A.

A full list of the materials I reviewed can be found at Appendix B – List of Materials and Data Considered.

#### **4.1 But for Boeing's Crimes of Omission/Lack of Disclosure/Falsification the FAA AEG Would Have Ordered Simulator Training**

*The complete omission of any and all substantive references to MCAS from both the 737 MAX Aircraft Flight Manual (AFM) and pilot training materials/emergency procedures was an ultimate "but for" cause of the crashes of Lion Air Flight 610 and Ethiopian Airlines Flight 302. This is due to the fact that Boeing's conspiracy of omission and falsification led to the Federal Aviation Administration's (FAA) Aircraft Evaluation Group (AEG) determining that only Level B training would be required for the 737 MAX.*

*(Note: Throughout this report, the terms "Level B" and "Level D" refer to computer-based training (Level B) vs training conducted in what is defined in the industry as a "Level D" (full-motion) simulator. In some countries, reference to "levels" of training is not applicable, although the functional equivalency is the same.)*

As a direct result of Boeing's conspiracy of intentional withholding of information from the FAA, the 737 MAX AFM lacked critical information pertaining to MCAS, and the relevant portions of the AFM and training materials were materially false, inaccurate and incomplete.

The intentional omission/lack of disclosure regarding MCAS, coupled with false, misleading and wholly inaccurate descriptions of MCAS' ultimate control authority and capabilities upon certification of the 737 MAX was directly causal to the crashes of Lion Air Flight 610 and Ethiopian Airlines Flight 302. These intentional falsehoods extended not only to the FAA and the international aviation community, but to Boeing's own customers, and ultimately, the flying (and non-flying) public.

After the FAA AEG published the final version of the 737 MAX Flight Standardization Report (FSR), Boeing continued to sell, and its customers were permitted to fly the 737 MAX. However, pilots flying the 737 MAX, both foreign and domestic, were provided no information regarding MCAS in any AFMs or pilot training materials/procedures.

It was a necessary part of Boeing's conspiracy that Lion Air and Ethiopian Airlines remain unaware as to the full scope of MCAS. If those airlines - or their pilots - had realized MCAS' potential safety implications, that information would have inevitably made its way back to the FAA, defeating the purpose of the conspiracy.

As a direct result of Boeing's omissions, lack of disclosure and falsifications to the FAA regarding the altered scope and authority of MCAS, more advanced, tactile and costly Level D simulator training for 737 MAX pilots was not mandated; instead, only minimal Level B computer-based training was required. The FAA AEG's determination that Level B training was sufficient was based entirely upon the false information about MCAS' operational capacity that Boeing provided to the FAA AEG.

The FAA AEG had never been presented with a complete, accurate and truthful description of MCAS illuminating its potential influence, hazards and vulnerabilities, (e.g., operating envelope, triggers, observed behavior in the simulator, etc.). Had they been, it is incontestable that they would have ordered a functional system description and emergency procedures be incorporated into the AFM. More critically, however, the FAA AEG would have **also** altered its assessment of pilot training requirements and mandated Level D, hands-on simulator training, as that is undoubtedly what was required to introduce, train and prepare 737 MAX pilots for potential MCAS emergencies. In reality, Level D training was ultimately required by the FAA AEG once they overcame the effects

of Boeing's conspiracy to deceive it and learned the true details about the operational scope and potential dangers of MCAS.

We can be certain that this opinion is valid, because once the FAA discovered the truth about MCAS, they enacted a mandate for Level D simulator training, even after changes had been made to ensure the system was far less dangerous than in its post-certification state. Thus, Level D simulator training remains the industry benchmark to date to ensure the safety of passengers and crew aboard 737 MAX aircraft.

Based upon my education, experience and training, (including mandatory Level D training on previous new aircraft systems/technologies in the past), such training would have been mandated by the FAA AEG had they known the truth about MCAS' scope and potential threat.

This is a rational conclusion, given that the very charter of the FAA AEG is to ensure the safety of air travel and of the flying public. The notion that Level D simulator training would not be required for potentially life-threatening, catastrophic flight control system malfunctions of which the FAA AEG was aware is absurd at best. Moreover, any deception of the FAA AEG would necessarily and foreseeably involve safety implications.

#### **4.2 FAA Requirements are Followed by Foreign Carriers**

*The omission of MCAS descriptions/procedures as well as the absence of a mandate for Level D simulator training was an additional "but for" cause of the crashes of Lion Air Flight 610 and Ethiopian Airlines Flight 302.*

The FAA AEG's approval of merely Level B training for all U.S.-based pilots established the training standard for every airline worldwide flying the 737 MAX, including Lion Air and Ethiopian Airlines; as such, neither airline required simulator training for their pilots. Moreover, both airlines' AFMs and training materials contained no information about MCAS because Boeing had successfully convinced the FAA AEG that MCAS was a mere extension of the existing Speed Trim System, (which is materially false) and would never activate within a "normal" commercial flight operating envelope. Thus, Boeing argued to the FAA AEG that pilots didn't need to know about MCAS' existence, purpose or functionality.

As stated, but for Boeing's crimes of omissions, lack of disclosure and falsification, the FAA AEG would have ordered MCAS to be included in the AFM and pilot training/emergency procedures materials. More critically, the FAA AEG would have mandated Level D simulator training for all U.S.-based 737 MAX pilots. Accordingly, these mandates would have also been followed by foreign carriers wishing to operate under International Civil Aviation Organization (ICAO) guidelines and/or in U.S. airspace under FAA jurisdiction, including Lion Air and Ethiopian Airlines. It is therefore a valid conclusion that, had Boeing had not committed its crime of concealing information from the FAA AEG, Level D simulator-based differences training for **all** pilots transitioning to the 737 MAX would have been required.

Thus, but for Boeing's crimes, the pilots of Lion Air Flight 610 and Ethiopian Airlines Flight 302 would have been aware of the presence of MCAS on their aircraft, and also would have been trained – hands on – in a Level D simulator as to how to recognize and respond appropriately to MCAS emergency scenarios in real time. Instead, the first time the two accident pilot crews ever faced these harrowing emergencies was during their

actual commercial flights while carrying airplanes full of unsuspecting, innocent passengers and crew.

### **4.3 Level D Simulator Training Would Have Prevented Both Accidents**

*To a reasonable degree of professional certainty and industry experience, had the pilots of Lion Air Flight 610 and Ethiopian Airlines Flight 302 undergone comprehensive Level D simulator training, neither of these accidents would have occurred.*

The complete absence of Level D simulator training for 737 MAX pilots with respect to MCAS was directly causal to the crashes of Lion Air Flight 610 and Ethiopian Airlines Flight 302, as complete, demonstrative training would have prevented both of these tragedies. Moreover, the absence of such training is an egregious violation of long-established, homogenous and globally-required pilot training/checking standards.

Not only do these benchmarks exist to ensure the safety of the flying public; they are continually evaluated and advanced as new technologies (i.e., MCAS) find their way on to modern, commercial transport-category aircraft to ensure pilots have all necessary information, training and tools at their disposal.

In contrast, the scant Level B, computer-based training provided to the pilots didn't even mention MCAS, much less address any of the critical safety-based issues that Boeing was aware of, namely:

- That the MAX was vulnerable to MCAS activations based on erroneous Angle-of-Attack (AOA) information because it relied on that information from only a single AOA sensor instead of two;
- That MCAS had a resync feature causing it to resync every time pilots attempted to stop the aircraft-nose-down (AND) trim caused by an erroneous MCAS activation, (a fact Boeing hid from the FAA AEG as well as the airlines);
- That MCAS only operated in a flaps-up condition and only in manual flight, (therefore MCAS was inactive if flaps were extended or the autopilot was engaged);
- That MCAS was capable of commanding AND trim to the full AND position, meaning MCAS could command so much AND trim that it would leave the pilots without elevator authority and without the ability to use the manual trim wheel due to the excessive control forces on the horizontal stabilizer.
- That an erroneous AOA can (and did, during the accident flights) cause some or all of the following additional highly-distracting indications/effects:
  - Continuous or intermittent stick shaker on the affected side
  - Minimum speed bar (red and black) on the affected side
  - Inability to engage the autopilot
  - Automatic disengagement of the autopilot
  - Indicated Airspeed (IAS) Disagree alert
  - Altitude (ALT) Disagree alert
  - AOA Disagree alert (only if the customer had paid for this option, which neither accident airline had, as Boeing should have made it standard but didn't)
  - Feel Differential Pressure light



It is consistent with my education, training and experience beyond a reasonable degree of professional certainty to assert that the doomed flight crews would have responded appropriately and expeditiously to their respective MCAS emergencies had they only been provided knowledge of MCAS's existence and proper Level D simulator training. In fact, both accident reports corroborate that the pilots were desperately attempting to follow applicable procedures based upon their knowledge and training; it follows that they would have acted similarly for an uncommanded MCAS activation emergency for which they had been properly trained and for which appropriate procedures existed. Instead, when the accident pilots – who were never provided with information even disclosing the existence of MCAS – were faced with erroneous and repetitive MCAS activation, they were predictably ill-equipped and unable to respond appropriately to the emergency. Additionally, the probability of identifying what was happening with MCAS was compounded by the multitude of conflicting aural and visual alerts/effects. The only way pilots could quickly and effectively make sense of what was happening was by having previously undergone comprehensive Level D simulator training; unfortunately, the accident pilots were never afforded this opportunity.

In accordance with my engineering and airframe certification/DER training and experience, 30 years of training and experience as a pilot (including over 3100 hours in the 737), and my industry experience utilizing my Masters in Aviation/Aviation Safety, I assert that I possess the necessary foundation and information to testify as to what form of pilot training the FAA AEG would have required had they been fully aware of the expanded scope of MCAS and the increased risk of its erroneous activation. Additionally, as a current 737 captain, I have undergone the post-grounding, 737 MAX return-to-service mandated MCAS training, which affords me unique insight as to what the FAA AEG would have required with regard to MCAS emergency simulator training. As such, I hold the opinion that the FAA AEG would have developed Level D simulator training to address all potential MCAS failure scenarios consistent with the conditions listed on page 4, and not certified any pilot to operate the MAX until he or she demonstrated proficiency in prompt and effective recovery from those scenarios.

In conclusion, that the pilots had received only Level B computer-based training which could be accomplished in under two hours on an iPad – with nary a mention of MCAS – placed any passenger or crewmember aboard a 737 MAX at a critically increased risk of death as a result of erroneous MCAS activation. This was clearly a life-threatening situation that the pilots were wholly unprepared to address, much less recognize. Sadly, we now know that uncommanded MCAS activation was not an emergency that properly-trained and aware pilots couldn't successfully address while continuing to ensure a safe condition of flight.

Thus, the *direct* connection between Boeing's crimes and the crashes of Lion Air Flight 610 and Ethiopian Air Flight 302 is indisputable: Boeing's crimes were the omissions and falsifications; the results were the loss of 346 human lives. As tragic as that catastrophic loss is, Boeing should also consider itself lucky that one or both crashes didn't occur over a populated area, magnifying the potential fatalities exponentially.

## **5.0 CONCLUSIONS AND OPINIONS**

In light of my educational and professional training and industry experience, I restate the following conclusions and opinions from my review and analysis of the supplied material listed in Appendix B, all of which are stated to a reasonable degree of professional certainty:

1. But for Boeing's crimes of omission/lack of disclosure/falsification the FAA AEG would have ordered Level D simulator training.
2. FAA requirements are followed by foreign carriers.
3. Level D simulator training would have prevented both the Lion Air 610 and Ethiopian Airlines 302 accidents and thus saved the lives of 346 people.

I may use portions or all of the documents and data listed in Appendix B, as well as any photographs, video, computer-generated animations and/or any exhibit prepared or used by other experts in this matter to support or supplement my opinions.

The above opinions are subject to supplementation depending upon the receipt of any additional information relevant to this case and not previously reviewed.

## **Appendix A - Curriculum Vitae of Vickie R. Norton, BSME, MSc, ATP**

### **VICKIE R NORTON, BSME MSc ATP PROJECT ENGINEER/AIRLINE TRANSPORT PILOT**

#### **EDUCATION**

Masters of Science Aviation/Aviation Safety, Florida Institute of Technology, 2014.  
Bachelor of Science Mechanical Engineering, Michigan Technological University, 1988.

#### **PROFESSIONAL ASSOCIATIONS**

Human Factors and Ergonomics Society, 2015  
National Association of Professional Women, 2015  
The Honor Society of Phi Kappa Phi, 2014  
Lawyer-Pilots Bar Association, 2010  
Airline Pilots Association, since 1995  
Aircraft Owners and Pilots Association, since 1994  
Southern California Professional Engineers Association, 1989 to 1994

#### **PROFESSIONAL EXPERIENCE**

##### **MEA FORENSIC ENGINEERS & SCIENTISTS**

Project Engineer, 2009 to Present

Responsible for technical investigations involving aircraft accident/incident reconstruction, system/powerplant malfunctions and failure analysis, operational, maintenance, regulatory and human factors effects. Case analysis includes NTSB report review; aircraft design/operating envelope, component design, assembly and installation; compliance with and adequacy of maintenance manuals and required inspection, repair and overhaul schedules, Service Bulletins and Airworthiness Directives; pilot-in-command training, licenses, ratings, proficiency and recency of experience; preflight planning and prevailing weather conditions, and the potential effects of "third party" (non-pilot) error, e.g. Air Traffic Control, flight dispatch, aircraft fueling/loading, airfield lighting/signage defects, etc.

##### **UNITED AIRLINES**

Captain, 1995 to Present

Responsible for the safe operation and the final authority of commercial flights operated under FAA Part 121

Scheduled Air Carriers for United Airlines, 15,000+ flight hours with 7,400+ hours as Pilot-in-Command at UAL. Type rated in the B767, B757, B737 and A-320; B747 Flight Engineer qualified. Experienced in operations in the domestic U.S., Alaska, Hawaii and Canada; Latin America, including Mexico City and San Salvador, and the Pacific Rim, including Narita, Osaka, Beijing, Shanghai, Seoul, Guam and Saipan. Currently qualified and operating as a Los Angeles-based Boeing 737 Captain.

##### **RENO AIR EXPRESS**

First Officer, 1994-1995

Operated British Aerospace Jetstream 31/32 twin turboprop aircraft as Second-in-Command for commercial flights under FAA Part 135 rules for commuter flights. Experienced in operations including no-autopilot, winter ops/icing, mountain flying and short-field takeoff and landing procedures.

##### **MCDONNELL DOUGLAS CORPORATION/DOUGLAS AIRCRAFT COMPANY, (DAC)**

Project Engineer/Team Leader, 1989-1994

Mechanical engineering applications ranging from product development through flight test, certification and product support engineering. Managed in-house design teams and commercial vendors from initial RFP through FAA certification. Authored technical information for airline training and maintenance manuals. Performed Failure Mode Analysis of both pre-certification as well as failed in-service components, including stress, strain, vibration and

metallurgical analysis. Participated in multiple Twinjet and Trijet on-site flight test programs in locations ranging from Edwards AFB, CA to Yuma, AZ to Roswell, N.M. Oversaw and certified vendor design and dynamometer testing through company FAA Designated Engineering Representative (DER) status. Member of joint FAA/DAC Weekly Accident/Incident Investigations Board, including failure sequences through analysis and overlay of digital flight data and cockpit voice recorders. Primary FAA/NTSB contact for DAC Brake Systems and Engineering Department. Presented various DAC engineering reports and accident/incident summaries at annual Team Conference and industry events, as well as FAA/NTSB hearings.

## **MAJOR PROJECTS**

Commercial aircraft steel brake performance/certification through FAR Part 25 aircraft flight testing and laboratory dynamometer testing. All testing was full-spectrum to include light weight and speed configurations up to and including maximum kinetic energy rejected takeoffs, (RTO's).

Re-established commercial aircraft industry steel brake wear limits as a result of investigation of major U.S. airline runway overrun. Affected aircraft were DC-8/DC-9/DC-10 and MD-80 series; brake wear limits were adjusted downward to reflect operation in a field-worn condition. Deposition given in U.S. District Court, Southern District of New York case of Goodyear Tire and Rubber Co. vs. McDonnell Douglas Corp., 1993.

MD-80 series aircraft landing gear vibration induced by brake and antiskid systems, resulting in multiple landing gear failures on touchdown. Investigation included detailed systems analysis of hydraulic response, hydraulic cross-talk and servo control valves integrated with MD-80 landing gear, braking system and antiskid control unit logic.

MD-80 series aircraft foreign object debris (FOD) investigation into the aft-mounted engines "fodding" when operating on non-grooved runways or those otherwise contaminated by standing water, snow or slush. Resulted in design and installation of nose landing gear-mounted spray deflectors.

MD-11 initial carbon brake development, full spectrum FAR Part 25 flight testing and integration with upgraded (from DC-10) antiskid, autobrake and brake temperature-monitoring/tire pressure-indicating systems and their associated software.

## **PUBLICATIONS**

Norton VR, Bailey MN (2011). Aircraft Accident Investigation: Eight Tips for Deploying an Aviation Expert. The Advocate, pp 82-86.

Norton VR (2015). Pilot Duty of Care and the Role of the Human Factors Expert. MEA Forensic Publications, Aviation Series.

## **LECTURES AND PRESENTATIONS**

March 2016 – Introduction to Aerospace Engineering, Long Beach State University, Long Beach, CA.

May 2015 - Introduction to Aerospace Engineering, Long Beach State University, Long Beach, CA.

November 2014 – Human Factors Considerations in General Aviation Accident Investigations, 2014 International Air and Transportation Safety Bar annual conference in New York, NY.

July 2014 – Pilot Duty of Care and the Role of the Human Factors Expert, 2014 American Association for Justice annual convention in Baltimore, MD.

April 2014 – Introduction to Aerospace Engineering, Long Beach State University, Long Beach, CA.

April 2013 – Introduction to Aerospace Engineering, Long Beach State University, Long Beach, CA.

May 2012 – Introduction to Aerospace Engineering, Long Beach State University, Long Beach, CA.

July 2011 – Court Reporting Tips from an Expert Witness, Sage College School of Court Reporting, Moreno Valley, CA.

May 2011 – Introduction to Aerospace Engineering, guest speaker at Long Beach State University, Long Beach, CA.

July 2010 – Top Three Things a Commercial Airline Pilot Would Change to Improve Aviation Safety. Aviation Section, American Association for Justice 2010 Annual Convention, Vancouver, BC.

May 2010 – Introduction to Aerospace Engineering, guest speaker at Long Beach State University, Long Beach, CA

February 2010 – Captain/Dispatcher Joint Authority under Part 121. Lawyer-Pilots Bar Association Winter Meeting, Hawks Cay Resort, FL.

#### **PROFESSIONAL DEVELOPMENT/TRAINING**

2016 – 50<sup>th</sup> Annual SMU Air Law Symposium, Dallas, TX.

2014 – Fatigue Risk Management Systems (FRMS), Capstone Project, Florida Institute of Technology.

2014 – Aviation Security, Florida Institute of Technology.

2014 – 48<sup>th</sup> Annual SMU Air Law Symposium, Dallas, TX.

2013 – Aircraft Accident Investigation, Florida Institute of Technology.

2013 – 47<sup>th</sup> Annual SMU Air Law Symposium, Dallas, TX.

2013 – Safety Management Systems, Florida Institute of Technology.

2013 – Advanced Aviation Physiology, Florida Institute of Technology.

2012 – Complex Aviation Systems, Florida Institute of Technology.

2012 – Human Factors in Man-Machine Systems, Florida Institute of Technology.

2012 – 46<sup>th</sup> Annual SMU Air Law Symposium, Dallas, TX.

2011 – Lawyer Pilots Bar Association, Carlsbad, CA.

2011 – 45<sup>th</sup> Annual SMU Air Law Symposium, Dallas, TX.

2010 – American Association for Justice 2010 Annual Convention, Vancouver, BC.

2010 – 44<sup>th</sup> Annual SMU Air Law Symposium, Dallas, TX.

2010 – Lawyer-Pilots Bar Association (LPBA) Winter Meeting, Hawks Cay Resort, FL.

2009 – USC Viterbi School of Engineering, Aviation Safety & Security: “Legal Aspects of Aviation Safety” Course.

2008 – FAA/United Airlines Runway Incursion/Operational Safety Course.

2005 – Private Rotorcraft - Helicopter license.

2004 – A-320 Type Rating.

2002 – United Airlines/FAA Advanced Security Training. (Domestic and International Operations)

2001 – 737 Type Rating.

1998-2001 – FAA Part 121 Extended Twin-Engine Over Water Operations (ETOPS)

1998 – 757/767 Type Rating.

1995 – Present - Annual Recurrent Qualification Training, United Airlines.

1995 – Present - FAA/UAL Security Training.

1995 – Present - Emergency Evacuation Training.

1995 – Present - Hazardous Materials Training.

1995 – Present - Takeoff and Landing Performance Calculations, (i.e. cluttered runway, bleeds-off, thrust-reverser inoperative, etc.)

1995 – Present - Windshear/Microburst Training and Recovery.

1995 – Present - Aircraft Unusual Attitude/Upset and Recovery.

1995 – Present - Winter Operations Training and Procedures.

1995 – Present - Proficiency Training/Proficiency Checks on currently qualified fleet in 9-18 month intervals.

1995 - 747 Flight Engineer License.

1995 - United Airlines "Actual Fire" Course. (Identification by fire type, location; methods of fighting)

1994-Present – Emergency Procedures Training for Commercial and Transport Category Aircraft Systems Failures/Engine Failures/Fires/Shutdowns.

1994-1996 - Consultant FAA DER with "Systems and Equipment" designation by FAA authorizing office ANM-130L.

1994 - Certified Flight Instructor (CFI) Airplane Single Engine Land, Ground Instructor. (non-current)

1992-Present – FAA Air Traffic Control Procedures/Airspace Requirements.

1991 - Awarded Company (Douglas Aircraft Co.) FAA Designated Engineering Representative (DER) with "Systems and Equipment" designation by FAA authorizing office ANM-130L.

1990-1994 – NTSB Probable Cause Report review/analysis.

1990-1994 - Presenter at annual Douglas Aircraft Company/Industry "Team Conference" Meetings.

1990-1992 – MD-11 FAR Part 25 Certification/Flight Test.

1990 - Accident Investigation Assistance Seminar. (Douglas Aircraft Company)

1989-1991 – Major Air Carrier Brake Overhaul/Maintenance Compliance Analysis.

1989 – Failure Mode Effects Analysis (FMEA) and Fault Tree Analysis (FTA) of Transport Category Aircraft Brake, Antiskid and Autobrake Systems.

**Appendix B- List of Materials and Data Considered**

- Documents:
  1. Boeing Company's Response to Motion for Disclosure of Relevant Information
  2. Deferred Prosecution Agreement
  3. Filed Reply in Support of CVRA Motion
  4. Victims' Families Proffer of Facts
  5. USA's Response to Victims' Rights Enforcement Motion
  6. USA's Response Disclosure
  7. Final Committee Report: The Design, Development and Certification of the Boeing 737 MAX
  8. Final Republic of Indonesia Aircraft Accident Investigation Report dated 29 Oct 2018
  9. The Federal Democratic Republic of Ethiopia Ministry of Transport Aircraft Accident Investigation Bureau Interim Investigation Report of Accident 737-8 (MAX) ET-AVJ, Operated by Ethiopian Airlines on 10 March 2019, Report No. AI-01/19 dated 09 March 2020
  10. Boeing Flight Crew Operations Manual Bulletin # TBC-19
  11. House Transportation and Infrastructure Committee Hearing on Boeing 747 Max- Reporter's Transcript of Video Recordings of the Examination of:
    - Randy Babbitt
    - Chelsey Sullenberger
    - Sharon Pinkerton
    - Dan Carey
    - Sara Nelson

**Appendix C – Compensation**

The compensation to be paid to my employer, MEA Forensic, for my review, analysis, expert report, travel, depositions and trial testimony for this case is at the rate of \$475.00 per hour, and is in no way predicated upon the outcome of the case.



**Appendix D – Publications**

Norton VR, Bailey MN (2011). Aircraft Accident Investigation: Eight Tips for Deploying an Aviation Expert. The Advocate, PP 82-86.

Norton, VR (2015). Pilot Duty of Care and the Role of the Human Factors Expert. MEA Forensic Publications, Aviation Series.

**Appendix E– Deposition and Trial Testimony****TRIALS**

<b><u>Date</u></b>	<b><u>Case Name</u></b>	<b><u>Law Office</u></b>	<b><u>Venue</u></b>
May 1, 2013	Jaspers vs. Bonde	Law Offices of Frank W. Mitchell	Las Vegas, NV
June 15, 2015	IARDC vs. In Re Ribbick Law	Illinois Attorney Registration & Disciplinary Commission	Chicago, IL
July 8, 2019	Ilczyszyn vs. SWA	Balaban & Spielberger	Oakland, CA

**ARBITRATIONS**

<b><u>Date</u></b>	<b><u>Case Name</u></b>	<b><u>Law Office</u></b>
December 12, 2016	Messina vs. Walker/Mc Air	Lane Powell

**DEPOSITIONS**

<b><u>Date</u></b>	<b><u>Case Name</u></b>	<b><u>Law Office</u></b>
September 1, 1993	Goodyear Tire & Rubber vs. McDonnell Douglas	Bryan Cave & Associates
May 9, 2012	Jaspers vs. Bonde	Jaspers vs. Bonde
July 10, 2012	Crews/Becker vs. Forward Technologies	Law Office of Cozen O'Connor
June 24, 2014	Rohera vs. Raytheon Aircraft Company	Greene Broillet & Wheeler
November 15, 2016	Pamir Airways vs. Honeywell	Kreindler & Kreindler
July 31, 2018	Ilczyszyn vs. SWA	Balaban & Spielberger
July 26, 2019	Woods vs. Boeing	Friedman & Rubin
August 15, 2019	Ward vs. USA	United States Dept of Justice
March 17, 2021	Mijac vs. USA	United States Dept of Justice
July 21, 2021	Bohnel, Martinez, Hill, Pollack, Lynam vs. Jet Blue	Friedman Rubin
September 28, 2021	Woods/Weiland vs. Boeing	Littlepage Booth & Leckman
October 14, 2021	Foster/Whitaker vs. United States	United States Dept of Justice